

$$\frac{4x-10}{x-3} = \frac{4}{7}$$

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book of

SOLVING EQUATIONS

Created By:

solving equations vocabulary terms

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Coefficient Constant

$$5x + 4 = 24$$

Variable Answer

variable: A letter that takes the place of an unknown #

coefficient: the # in front of the variable

constant: a # w/o variable plain naked #

ONE STEP EQUATIONS

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TO UNDO ADDITION → Subtraction
TO UNDO SUBTRACTION → Addition
TO UNDO MULTIPLICATION → Division
TO UNDO DIVISION → Multiplication

Solve for the MISSING VARIABLES

ex 1

$$x + 5 = 30$$
$$\begin{array}{r} -5 \\ \hline \end{array}$$

$x = 25$

ex 2

$$a - 10 = 12$$
$$\begin{array}{r} +10 \\ \hline \end{array}$$

$a = 22$

ex 3

$$5k = 35$$
$$\begin{array}{r} \div 5 \\ \hline \end{array}$$

$k = 7$

ex 4

$$3 \cdot \frac{B}{3} = 10 \cdot 3$$

$B = 30$

MULTI STEP EQUATIONS

STEP 1:	DISTRIBUTE
STEP 2:	COMBINE LIKE TERMS ON EACH SIDE.
STEP 3:	MOVE VARIABLES TO ONE SIDE.
STEP 4:	MOVE CONSTANTS TO THE OTHER SIDE.
STEP 5:	MULTIPLY BY DENOMINATOR OR DIVIDE BY THE COEFFICIENT.

Solve for the MISSING VARIABLES

ex 1

$$\frac{3x}{4} + 4 = 10$$

ex 2

$$-2(-w + 2w - 3) = 30$$

EQUATIONS W/ VARIABLES ON BOTH SIDES

STEP 1:	MOVE THE SMALLER VARIABLE TO ONE SIDE.
STEP 2:	MOVE CONSTANTS TO THE OTHER SIDE.
STEP 3:	MULTIPLY BY DENOMINATOR OR DIVIDE BY THE COEFFICIENT.

Solve for the MISSING VARIABLES

ex 1

$$5k - 2 = 8k + 4$$

$$\begin{array}{r} -5k \\ -5k \end{array}$$

$$-2 = 3k + 4$$

$$\begin{array}{r} -4 \\ -4 \end{array}$$

$$-6 = 3k$$

$$-2 = k$$

k = -2

ex 2

$$2w - 10 = 2w - 9$$

$$\begin{array}{r} -2w \\ -2w \end{array}$$

$$-10 = -9$$

$$-3 = 4$$

No Solution

ex 3

$$4z + 2 = 2 + 4z$$

$$\begin{array}{r} -4z \\ -4z \end{array}$$

$$2 = 2$$

Same = same

Infinite Solutions

MULTI-STEP EQUATIONS WITH VARIABLES ON BOTH SIDES

Solve for the MISSING VARIABLES

ex 1

*When you have more than 1 term, use parentheses.

$$\frac{(x+3)}{(x-3)} = \frac{2}{1}$$

*cross multiply

$$(x+3) \cdot 1 = 2(x-3)$$

$$x+3 = 2x-6$$

$$\begin{array}{r} +6 \\ +6 \end{array}$$

$$x+9 = 2x$$

$$\begin{array}{r} -x \\ -x \end{array}$$

$$9 = x$$

ex 2

$$\frac{1}{3}(3x-12) + 5 = 2(x-8) - x + 17$$

$$1x - 4 + 5 = 2x - 16 - x + 17$$

$$x + 1 = x + 1$$

infinitely many solutions

TWO STEP EQUATIONS

STEP 1: ADD OR SUBTRACT CONSTANT

STEP 2: MULTIPLY OR DIVIDE BY COEFFICIENT

Solve for the MISSING VARIABLES

ex 1

$$3x - 8 = 10$$

$$+8 \quad +8$$

$$\frac{3x}{3} = \frac{18}{3} \quad \boxed{x=6}$$

ex 2

$$\frac{a}{4} - 10 = -12$$

$$+10 \quad +10$$

$$4 \cdot \frac{a}{4} = -2 \cdot 4 \quad \boxed{a=-8}$$

ex 3

$$3 \cdot \frac{-4z}{3} = 10 \cdot 3$$

$$\frac{-4z}{-4} = \frac{30}{-4}$$

$$z = -7.5 \quad \text{OR} \quad -\frac{15}{2}$$

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MULTI STEP EQUATIONS

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STEP 3: MOVE VARIABLES TO ONE SIDE.

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STEP 5: MULTIPLY BY DENOMINATOR OR DIVIDE BY THE COEFFICIENT.

Solve for the MISSING VARIABLES

ex 1

$$\frac{3x}{4} + 4 = 10$$

$$-4 \quad -4$$

$$4 \cdot \frac{3x}{4} = 6 \cdot 4 \quad \boxed{x=8}$$

$$\frac{3x}{3} = \frac{24}{3}$$

ex 2

$$-2(-w + 2w - 3) = 36$$

$$2w - 4w + 6 = 36$$

$$-2w + 6 = 36$$

$$-6 \quad -6$$

$$\frac{-2w}{-2} = \frac{30}{-2}$$

$$\boxed{w=-15}$$

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ONE STEP EQUATIONS

TO UNDO ADDITION → _____

TO UNDO SUBTRACTION → _____

TO UNDO MULTIPLICATION → _____

TO UNDO DIVISION → _____

PAGE 2

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ex 1

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ex 2

$$a - 10 = 12$$

ex 3

$$5K = 35$$

ex 4

$$\frac{B}{3} = 10$$